MidiPatterns

user manual

version 1.0.0

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Introduction

Features

MidiPatterns is a multitrack, pattern-oriented, MIDI step sequencer.

It does not generate sounds by itself. Its task is to send notes and control messages to any MIDI compatible hardware or software instrument.

You can use it as a simple drum machine, or to handle complex multi-timbral, polyphonic scores, controlling multiple software synthesizers and hardware expanders at once.

Its main features are:

- multitrack: virtually up to 32000 polyphonic MIDI tracks per document, altough memory, MIDI system capabilities and your sanity will probably lower that limit
- multiple MIDI devices support
- variable patterns size, up to 32000 patterns per document
- powerful modulation capabilities
- sophisticated "swing" and randomizing capabilities to improve expressiveness
- song mode
- MIDI files import and export
- MIDI clock master and slave options
- powerful mute & solo features
- drag & drop support

MidiPatterns is a 32/64-bit Intel fat binary that runs on Mac OS X 10.6.6 (Snow Leopard) and later versions.

Getting started

If you are already using your computer with MIDI, then you probably already have experience with sequencers, so just press the ">" button and start clicking the cells in the score to hear something. You may want to return to this manual later to understand in detail what MidiPatterns has to offer.

If this is not the case, review the "MIDI management" chapter first, to make sure you will be able to hear something. Then please read the "Concepts" and "User interface" chapters.

MidiPatterns has a few sample .mpn files embedded in it. To save them on your computer, please use the "Extract Examples..." command of the "File" menu.

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Concepts

This section explains the terminology used in this manual.

Instrument map

An instrument map describes the instruments banks and patches defined by a particular MIDI standard or extension and, in case of percussive sounds, also maps MIDI note numbers to instruments names.

MidiPatterns supports the GM (General MIDI), Roland GS, Yamaha XG and Yamaha Motif Rack ES standards.

Score

The score is the tool that MidiPatterns uses to build its sequences. It's a grid, where each row represents a MIDI note and each column represents a "beat". Each intersection between a row and a column can host an "event".

Beat

A beat, or step, represents a moment in time when an event can be fired. Of course, many events can share the same beat.

Event

An event holds a single MIDI note that belongs to a beat. Events have some user controllable properties:

- MIDI **velocity** range; each time the event is fired, velocity is randomly chosen within the user specified range; velocity can span between 0 and 127;
- **duration**; each time the event is fired, duration is randomly chosen within the user specified range; duration spans between $1/64^{th}$ and $4/4^{th}$;
- **probability** determines how many chances the note has of being actually generated;
- **swing** controls the anticipation or delay relative to the exact beat timing; the note is advanced or delayed by an amount randomly ranging from zero to swing/2.

Track

Tracks are used to gather notes that are intended to be sent to the same MIDI device, on the same MIDI channel. There are 3 types of tracks:

- **percussive**, meant to be used with sounds of indefinite pitch; here each note actually represents a different instrument; newly created documents initially contain an empty percussive track;
- **chromatic**, meant to be used with tuned sounds;
- **metronome**; a MidiPatterns document always contains a metronome track, which you cannot delete.

Each track refers to a specific instrument map and uses it to name its rows.

Each beat in a track can send a number of MIDI control messages, collectively called "modulations", to the corresponding device and channel. Modulations include **volume**, **reverb**, **chorus**, **attack**, **decay**, **release**, **pan**, **cutoff** and **resonance**. Each value is randomly chosen each time within the user specified ranges.

Pattern

A pattern is a sequence of beats (steps). It has properties like:

- **name**;
- **tempo**, expressed in beats per minute, from 8 to 1000;
- **beats per quarter**, (bpq) from 1 to 24;
- **quarters per pattern**, (qpp) from 1 to 9.

Since the number of beats in a pattern is the product between the bpq and the qpp values, a pattern can have a number of beats comprised between 1 and 216.

Song step

A song step is made by a reference to a pattern and the number of times the pattern must be repeated.

Song

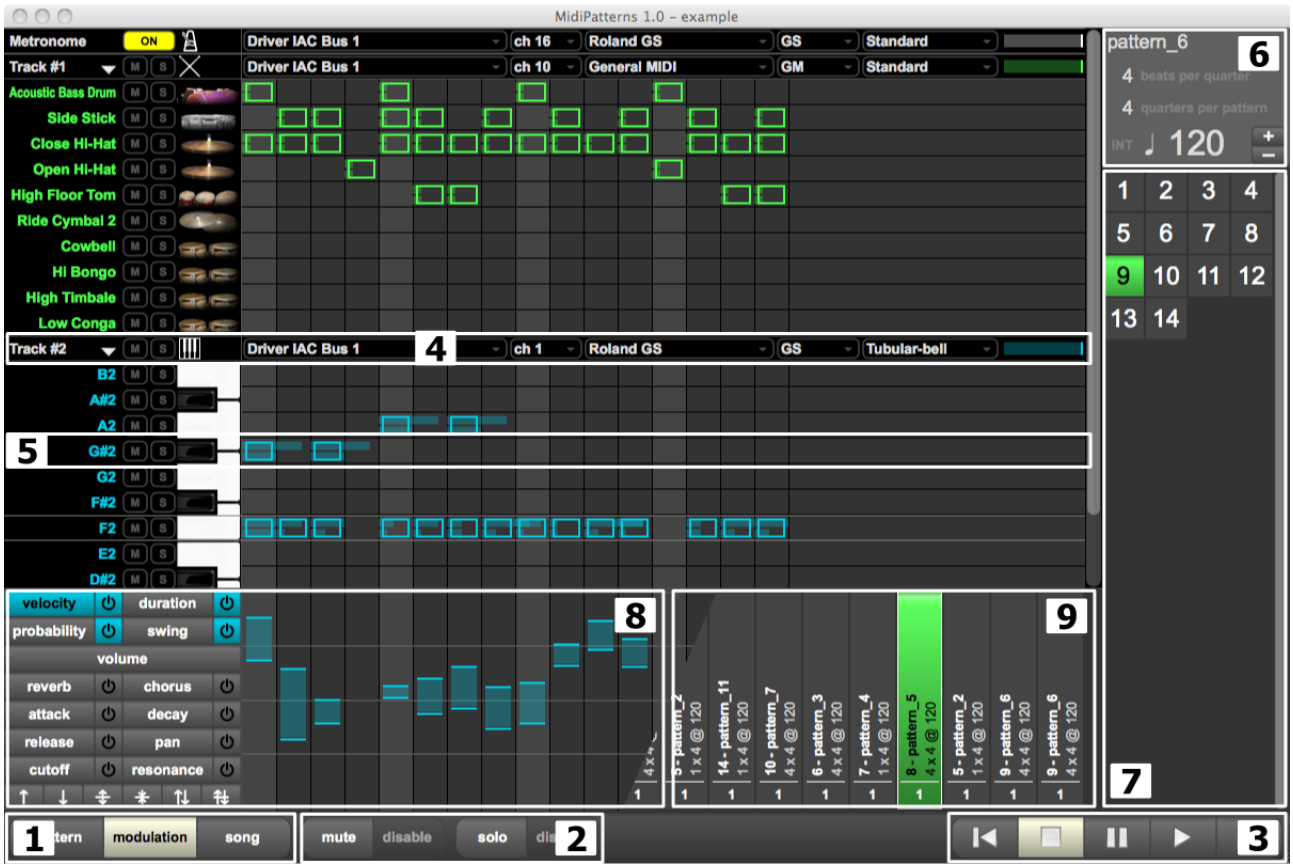
A song is a sequence of song steps. There's one and only song in a MidiPattern document.

Default document

If you are repeatedly working on the same document each time you open MidiPatterns, you may find the "Choose Default Document..." command of the "File" menu useful.

It will simply load that document when you launch the application, instead of just creating a new, empty one. If you change your mind, use the "Cancel Default Document..." command.

User interface



This is a typical MidiPatterns window.

The control panel, located at the bottom, contains:

1 - the mode selector

2 - the mute & solo buttons

3 - the transport buttons

The score occupies the main part of the window and contains:

4 - the track headers

5 - the instruments/notes rows

The patterns panel is located at the right end and contains:

6 - the pattern properties editor

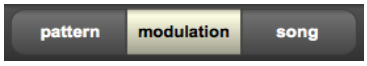
7 - the patterns selector

Accordingly to the currently selected mode, the lower space of the score might host:

8 - the modulation editor, or

9 - the song editor

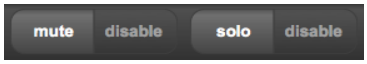
The mode selector



In "pattern" mode, which is the initial mode when you start MidiPatterns for the first time, the score fills the entire space available. Click the "modulation" or "song" selectors to show the corresponding editors at the bottom of the window.

MidiPatterns remembers the mode that is in use when you save a document and restores it when you reopen that document.

The mute & solo buttons



The "mute" switch is shown in red when at least one of the "M" switches in the instruments/notes rows or tracks headers is on. That is, if at least one MIDI note in a track or an entire track is muted.

If no "M" switch is active, pressing the "mute" switch activates all individual instrument/note rows switches (but not those belonging to the tracks headers). Otherwise, any active "M" switch is deactivated.

The "disable" switch near the "mute" switch is enabled only when the "mute" switch is on. You can use it to switch between the muted and unmuted state without changing the current mute configuration.

The "solo" and "S" switches behave in an analogous way, except that the color used to indicate the solo state is green.

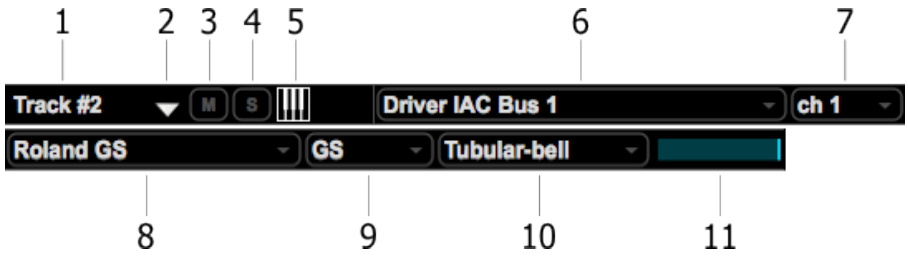
The transport buttons

These are the usual buttons to start, stop and pause the sequence playback.

You can also use the space bar on your Macintosh keyboard to start playback. Pressing the space bar during playback puts MidiPattern in pause, until you press it again. To completely stop playback, press "alt" and the space bar togheter.

The "|<" and ">|" buttons behave differently according to the current mode. When in "pattern" or "modulation" mode, they select the previous or the next pattern in the list, if any. When in "song" mode and with MidiPatterns in stop state, they jump to the first or last step of the song.

The track headers



Each track header contains:

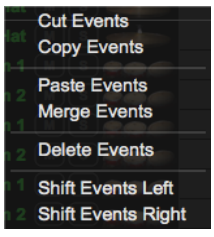
1. the track name; with percussive and chromatic tracks, right-clicking on the track name will open a menu with commands to delete or duplicate the track; a "Visible Range" submenu allows to define in detail which instruments or notes are to be shown; for the metronome track, the menu will show a menu containing the available instruments for the chosen bank

and set; use the "New Percussive Track" or "New Chromatic Track" commands of "Edit"menu to add new tracks;

2. a collapse/expand arrow; click it to show or hide the instrument/note rows belonging to the track;
3. a mute "M" switch; when this switch is on (red), the corresponding track is inaudible; an active mute switch could be grayed if for some reason its state is superseded by other settings, for instance the state of the mute-enable switch in the control panel;
4. a solo "S" switch; when this switch is on (green), only tracks in this state are audible; an active solo switch could be grayed if for some reason its state is superseded by other settings, for instance the state of the solo-enable switch in the control panel or the "M" switch of the track;
5. a track type symbol: for percussive tracks, for chromatic tracks and for the metronome track;
6. a MIDI devices menu, containing all available or referenced output devices; the menu shows the currently selected device for the track; if that device is unavailable, "(offline)" will appear next to its name; this menu is disabled during playback;
7. a MIDI channels menu; some channels in this menu could be grayed, if they are already in use by other tracks;
8. an instrument maps menu;
9. a banks menu containing the available instrument banks for the chosen map;
10. a patches menu containing the available instruments for the chosen bank;
11. a volume control slider.

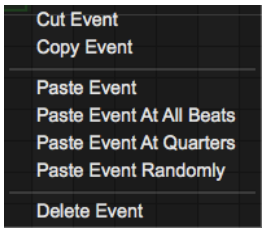
The instruments/notes rows

Each instrument/note row contains:



1. the instrument/note name; click it to hear how this row sounds; right-click it to open a menu with various editing commands for the events on the row;
2. a mute "M" switch; when this switch is on (red), the corresponding note is inaudible; an active mute switch could be grayed if for some reason its state is superseded by other settings, for instance the state of the mute-enable switch in the control panel or the "M" switch of the owner track;
3. a solo "S" switch; when this switch is on (green), only notes in this state are audible; an active solo switch could be grayed if for some reason its state is superseded by other settings, for instance the state of the solo-enable switch in the control panel, or the "M" or "S" switches of the owner track, or the "M" switch of the row;
4. a percussive instrument category image (for percussive tracks) or a piano key (for chromatic tracks); click it to hear how this row sounds; drag and drop the image to move all the events belonging to the row to another row;

5. a series of cells, one for each beat, each potentially holding an event; events are represented as rectangles whose color changes according to which track they belong to; a couple of strips indicate the minimum and maximum duration for the note; when in "pattern" or "modulation" modes, you can click an emtpy cell to insert an event or click on an existing event to remove it; right-click a cell to open a menu with various editing commands; use drag and drop to move single events around.



Instrument/note rows can be selected. There can only be a single row selected at once and it's shown with thin white borders. To select a row, click it or use the up and down arrow keys on the keyboard. The selected row determines the content of the modulation editor.

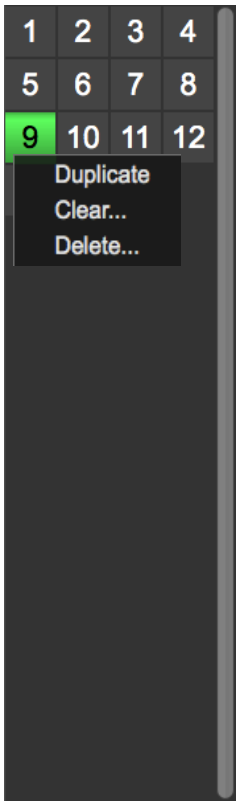
The pattern properties editor

This panel shows the properties of the current pattern. By clicking on the white items, you can change the pattern's name, tempo (expressed in beats per minute), the number of beats (steps) per quarter and the number of quarters in the pattern.

All properties can be modified only when MidiPatterns is in stop state, except for the tempo value, which can be changed during playback in "pattern" or "modulation" mode, also using the "+" and "-" buttons, which apply a 10 bpm variation.

Of course the tempo value cannot be changed when MidiPatterns is in MIDI slave mode, that is, when the "Clock source" setting in the "MIDI Preferences" dialog shows "External MIDI Sync". If this is the case, the clock source indicator turns from "INT" to "EXT".

The patterns selector



This panel shows all patterns defined in the current MidiPatterns document.

Patterns are represented as gray squares with a white identification number.

The current pattern is shown in green and its properties appear in the pattern properties editor, while its events and related properties are shown in the score and inside the modulation editor (if visible).

When in "pattern" or "modulation" mode, pressing the play button will start repeating the current pattern indefinitely.

To select another pattern, just click on it. The tracks editor, and the modulation editor, if shown, will change to reflect your choice.

If MidiPatterns is in playback, the pattern will became active only when the current pattern has finished playing. During this time, the next pattern will be shown in orange and you can select another one. You cannot change the current pattern while in "song" mode during playback.

Right-click a pattern to open a menu with commands to duplicate, delete or clear the pattern. Clearing means removing all the currently defined events from the pattern.

To duplicate a pattern, you can also drag and drop it on the empty space of the pattern selector.

If you drop the pattern upon another pattern, you will be asked if you want to

merge them. Merging means adding the events from the first pattern to the second, overwriting them if necessary.

Finally, you can drop a pattern over the song editor to add a new step to the song.

The "Edit" menu in the application menu bar contains commands to create a new, empty pattern or to delete all existing patterns, resetting the document to its default state.

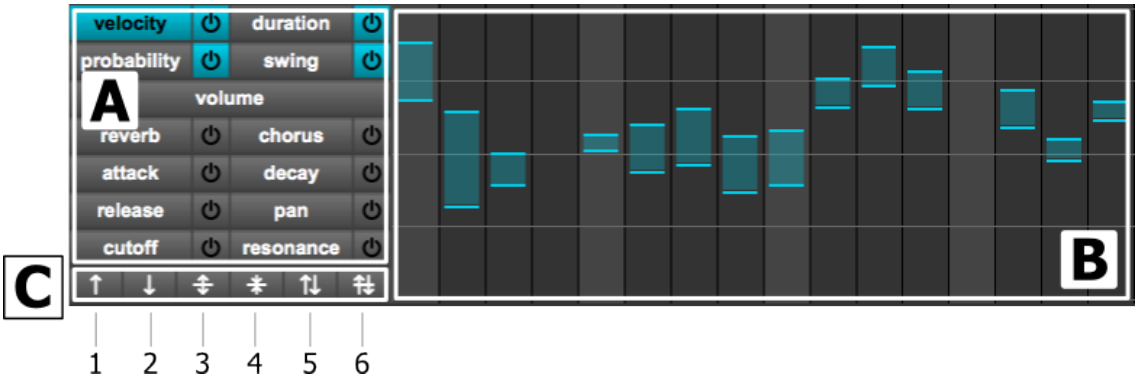
The modulation editor

The modulation editor allows the detailed control of event and track properties. It contains:

A) the properties selectors

B) the sliders panel

C) the editing buttons



The columns in the sliders panel are synchronized with the score and thus vary with the current pattern size and scroll position.

When an instrument/note row is selected in the score, a slider is shown for each existing event in the row. The slider represents the values of the selected kind of property for the event or beat.

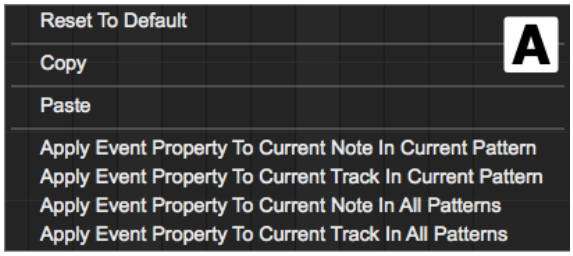
The properties selectors are colored differently to reflect the distinction between the properties that belong to each single event, like velocity, duration, probability and swing, from those shared by all the events belonging to the same beat of the same track, like volume, reverb, chorus, attack, decay, release, pan, cutoff and resonance.

Probability and swing have a single value, while all the other properties have both a minimum and a maximum value. Minimum and maximum can coincide, but if they differ, each time the event is sent, the actual value is chosen randomly between them.

Near to each selector, there is an on/off switch, whose state has meaning shown in the following table.

Property	**when switched on**	**when switched off**
velocity	a value randomly chosen between min and max is sent	the maximum value is sent
duration	a value randomly chosen between min and max is sent	the maximum value is sent
probability	the note may be sent or not according to probability	the note is always sent
swing	a random, proportional anticipation or delay is applied	no swing is applied
volume	a value randomly chosen between min and max is sent	not sent

Property	when switched on	when switched off
reverb	a value randomly chosen between min and max is sent	not sent
chorus	a value randomly chosen between min and max is sent	not sent
attack	a value randomly chosen between min and max is sent	not sent
decay	a value randomly chosen between min and max is sent	not sent
release	a value randomly chosen between min and max is sent	not sent
pan	a value randomly chosen between min and max is sent	not sent
cutoff	a value randomly chosen between min and max is sent	not sent
resonance	a value randomly chosen between min and max is sent	not sent


Reset To Default
Copy
Paste
Apply Event Property To Current Note In Current Pattern
Apply Event Property To Current Track In Current Pattern
Apply Event Property To Current Note In All Patterns
Apply Event Property To Current Track In All Patterns
A
Reset To Default
Copy
Paste
Apply Modulation To Current Track In Current Pattern
Apply Modulation To Current Track In All Patterns
B

Sliders can be manipulated individually, clicking and dragging their endpoints vertically or just clicking to set a new position.

You can also click and drag while moving the mouse horizontally to rapidly apply variations to several sliders at once.

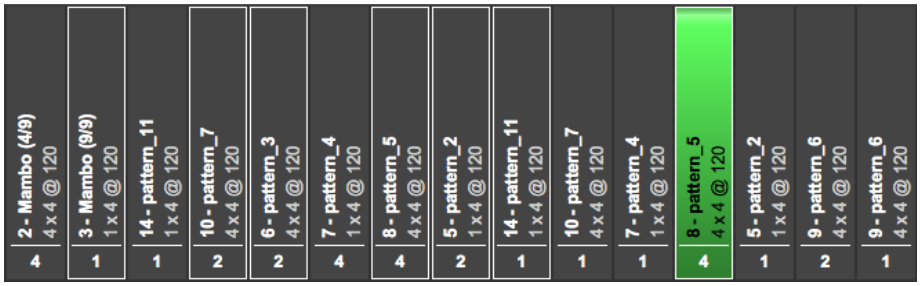
Finally, right-click a column containing a slider to open a menu with various editing commands. There are different menus for event (A) and beat (B) related sliders.

The editing buttons can be useful to collectively change all the sliders.

1. Increases both the minimum and maximum values.
2. Decreases both the minimum and maximum values.
3. Increases the maximum value and decreases the minimum value (expands).
4. Decreases the maximum value and increases the minimum value (compresses).
5. Randomly changes both the minimum and maximum values.
6. Randomly changes the centroid of the bars.

The song editor

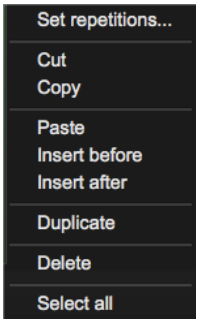
The song editor allows you to assemble existing patterns into a song. In a new document, this editor is initially empty.



To start building a song, drag one pattern from the patterns selector and drop it on the song editor. A new song step will appear, showing the properties of the pattern along with a number, in the bottom, showing the number of times the pattern will be repeated before passing to the next step during the song playback.

Double-click a song step to open a window to change its number of repetitions.

The current step, drawn in green, is the step from which song playback will begin when you hit the start button. To choose a different step, just click on it.



Clicking also has the effect of selecting a step. Selected steps have a thin white border around them. You can select more than a single step at once if you shift-click, to extend selection, or command-click, to add to or remove from selection.

Right-click a step to open a menu with various editing commands. All available commands apply to the currently selected steps only.

MIDI Management

Devices, channels and tracks

Since MidiPatterns is a MIDI sequencer, it needs at least one active MIDI output device driver on your computer to function properly. Otherwise, although its interface is fully functional, you won't be able hear anything.

The list of the available devices can be varied and include:

- MIDI hardware devices physically connected to your computer through a USB port or a MIDI interface;
- MIDI hardware devices physically connected to another computer on your local ethernet or wireless network, linked through a session of the network driver of the Audio MIDI Setup application;
- MIDI software devices installed on your computer;
- MIDI software devices installed on another computer on your local ethernet or wireless network, linked through a session of the network driver of the Audio MIDI Setup application.

If you don't have any real or virtual MIDI device at hand, you can activate one or more ports of the IAC Driver in the Audio MIDI Setup application.

Importing MIDI

MidiPatterns can import MIDI files with the “Import MIDI...” command from the “File” menu.

Please note that in the resulting MidiPatterns document, the tracks layout will not necessarily reflect the original MIDI file layout. This is because the import process uses MIDI channel numbers to determine how many tracks to create and gathers all messages sharing the same channel into the same MidiPatterns track.

As a consequence of this, the maximum number of tracks resulting from a MIDI import is 16, plus the metronome track.

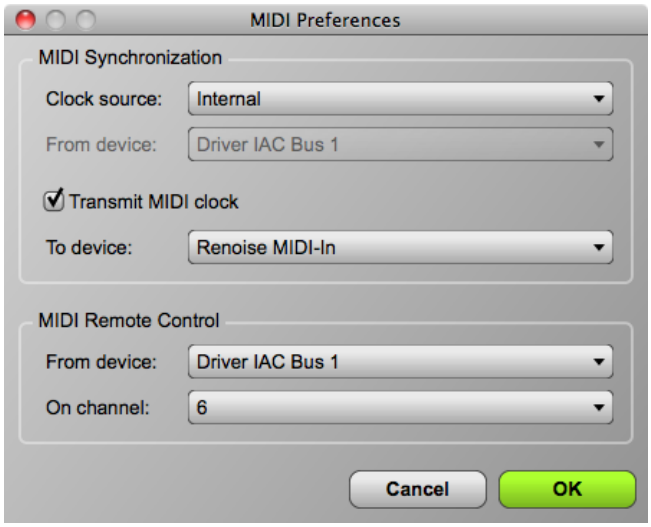
Exporting MIDI

MidiPatterns can convert the current song into a MIDI file with the “Export MIDI...” command from the “File” menu. This command is available when the document contains at least one track beyond the metronome track.

Please note that since MidiPatterns can address much more MIDI channels beyond the 16 available to a MIDI file, the resulting MIDI file will contain the same number of tracks found in the MidiPatterns document, but tracks addressing the same MIDI channel onto different devices will simply address the same channel.

For this reason, if you plan to use this function, you should probably limit the number of tracks in your MidiPatterns document to 16, metronome track excluded.

MIDI preferences



To open the MIDI preferences dialog, select "MIDI Preferences..." from the "MidiPatterns" menu.

The "MIDI Synchronization" section deals with MIDI clock messages.

If you want MidiPatterns to act as a MIDI clock master, set "Clock source" to "Internal", activate "Transmit MIDI clock" and select a slave device between those listed by the "To device" menu.

MidiPatterns transmits start, continue, stop and clock messages. Please note that if you don't use this feature, you may want to turn off "Transmit MIDI clock" to avoid wasting CPU resources and MIDI traffic.

If you want MidiPatterns to act as a MIDI clock slave, set "Clock source" to "External MIDI Sync" and select a master device between those listed by the "From device" menu.

The "MIDI Remote control" section lets you choose the device and channel from which to receive control messages. Please see the "MIDI implementation reference" section to learn which messages MidiPatterns responds to.

MIDI implementation reference

<table>
<tr><th colspan="3">Functions</th><th>Transmitted</th><th colspan="2">Recognized</th></tr>
<tr><td colspan="3">Basic Channel</td><td>1 - 16</td><td colspan="2">1 - 16</td></tr>
<tr><td colspan="3">Note Number</td><td>0 - 127</td><td colspan="2">X</td></tr>
<tr><td rowspan="9">Channel Voice</td><td colspan="2">Note Off event</td><td>X</td><td colspan="2">X</td></tr>
<tr><td colspan="2">Note On event</td><td>O</td><td colspan="2">X</td></tr>
<tr><td colspan="2">Polyphonic Key Pressure</td><td>X</td><td colspan="2">X</td></tr>
<tr><td rowspan="6">Control Change</td><td>7 Channel Volume</td><td>O</td><td colspan="2">X</td></tr>
<tr><td>10 Pan</td><td>O</td><td colspan="2">X</td></tr>
<tr><td>14 Mode</td><td>X</td><td colspan="2">0 - pattern
1 - modulation
2 - song</td></tr>
<tr><td>15 Transport</td><td>X</td><td colspan="2">0 - stop
1 - start
2 - pause</td></tr>
<tr><td>16 Set Tempo MSB</td><td>X</td><td>0 - 3</td><td rowspan="2">8 – 895 bpm</td></tr>
<tr><td>17 Set Tempo LSB</td><td>X</td><td>0 - 127</td></tr>
<tr><td colspan="2">32 Set Pattern</td><td>X</td><td colspan="2">0 - 127</td></tr>
<tr><td colspan="2">71 Harmonic Content</td><td>O</td><td colspan="2">X</td></tr>
</table>

Functions			Transmitted	Recognized
		72 Release Time	O	X
		73 Attack Time	O	X
		74 Brightness	O	X
		75 Decay Time	O	X
		91 Reverb Depth	O	X
		93 Chorus Depth	O	X
	Program Change		X	X
	Channel Pressure		X	X
	Pitch Wheel Change		X	X
Channel Mode	All Sound Off		X	X
	Reset All Controllers		X	X
	Local Control		X	X
	All Notes Off		O	X
System Common	System Exclusive		X	X
	MIDI Time Code		X	X
	Song Position Pointer		X	X
	Song Select		X	X
	Tune Request		X	X
	End of Exclusive		X	X
System Real Time	Clock		O	O
	Start		O	O
	Continue		O	O
	Stop		O	O
	Active Sensing		X	X
	Reset		X	X